ABSTRACT

An interfacial force microscope includes a differential-capacitance displacement sensor having a tip mounted on an oscillating member. The sensor generates displacement signals in response to oscillations of the member. A scanner is adjacent the sensor and supports a sample to be imaged. The scanner is actuable to move the sample relative to the sensor to bring the tip into intermittent contact with said sample as the member oscillates. A controller is in communication with the sensor and the scanner. The controller includes a sensor feedback circuit receiving the displacement signals and an AC setpoint signal. The AC setpoint signal has a frequency generally equal to the frequency at the peak of the displacement versus frequency curve of the sensor. The output of the sensor feedback circuit is applied to the sensor to oscillate the member. The controller also provides output to the scanner in response to the displacement signals to control the separation distance between the sensor and the sample.